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IS 9401-9 (1987): Method of measurement of works in river valley projects (dams and appurtenant structures): Part 9 Lining [WRD 23: Measurement and Cost Analysis of Works For River Valley Projects]



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Indian Standard

METHOD OF MEASUREMENT OF WORKS IN RIVER VALLEY PROJECTS (DAMS AND APPURTENANT STRUCTURES)

PART 9 LINING

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Indian Standard

METHOD OF MEASUREMENT OF WORKS IN RIVER VALLEY PROJECTS (DAMS AND APPURTENANT STRUCTURES)

PART 9 LINING

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Indian Standard

METHOD OF MEASUREMENT OF WORKS IN RIVER VALLEY PROJECTS (DAMS AND APPURTENANT STRUCTURES)

PART 9 LINING

0. FOREWORD

0.1 This Indian Standard (Part 9) was adopted by the Indian Standards Institution on 15 February 1987, after the draft finalized by the Measurement of Works of River Valley Projects Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 In measurement of quantities in construction of river valley projects, a large diversity of methods exist at present according to local practices. This lack of uniformity creates complication regarding measurements and payments. This standard is intended to provide guidance regarding a uniform basis for measurement of lining of canals and other structures in river valley projects.

0.3 In reporting the results of measurement made in according with this standard, if the final value, observed or calculated, is to be rounded off, it shall be done in accordance with IS : 2-1960*.

1. SCOPE

1.1 This standard covers the method of measurement of lining of canals and other structures in river valley projects works.

2. GENERAL RULES

2.1 Clubbing of Items — Items may be clubbed together provided these are on the basis of the detailed description of items stated in this standard.

2.2 Booking of Dimensions — In booking dimensions, the order shall be consistent and generally in the sequence of length, breadth or width and height or depth or thickness.

*Rules for rounding off numerical values (revised).

2.3 Description of Items — The description of each item shall, unless stated otherwise, be had to include where necessary, conveyance and delivery, handling, loading, unloading, storing, hoisting, lowering, all labour for finishing to required shape and size.

2.4 Dimensions — All works shall be measured net in decimal system as fixed in its place as given in **2.4.1** and **2.4.2**.

2.4.1 Dimensions shall be measured to the nearest 0.01 m except membrane which shall be measured to the nearest 0.001 m.

2.4.2 Areas shall be worked out to the nearest 0.01 m².

2.5 Work to be Measured Separately — Work executed in the following conditions shall be measured separately:

- a) Work in normal dry condition, that is, the condition in which lining can be laid without dewatering;
- b) Work under water;
- c) Work in liquid mud; and
- d) Work interrupted by tides.

2.5.1 The dewatering to be done in items (b) to (d) shall be measured separately as in IS : 4901 (Part 2)-1982*.

2.6 Bill of Quantities — The bills of quantities shall fully describe the materials and workmanship, and accurately represent the work to be executed.

2.7 The work in beds and sides shall be measured separately.

3. METHOD OF MEASUREMENT

3.1 The brick/tile/stone/rubble/concrete/membrane lining shall be fully described and include the following items (whichever applicable):

- a) Preparation of sub-grade to exact level including watering and fine dressing according to detailed specifications;
- b) Removal of waste; and
- c) Laying of lining according to detailed specifications and curing.

*Method of measurement of works in river valley projects (dams and appurtenant structures): Part 2 Dewatering.

3.2 All types of lining shall be measured in square metres on exposed surface stating the thickness.

3.3 Sleeper beams, fillets, lip and coping shall be measured in cubic metres.

3.4 Iron work like fixing iron rungs in lined slopes shall be measured separately.

3.5 If fillers, bitumen paper or any other fill are used, they shall be fully described and measured in square metre stating thickness.

3.6 All types of valves and porous blocks shall be fully described and measured in numbers.

3.7 On-cross and longitudinal drain (where required), shall be fully described and measured in running metres stating cross section or diameter.

INTERNATIONAL SYSTEM OF UNITS (SINUITS)

Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane Angle	radian	rad
Solid angle	steradian	sr

Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	$1 \text{ N} = 1 \text{ kg.m/s}^2$
Energy	joule	J	$1 \text{ J} = 1 \text{ N.m}$
Power	watt	W	$1 \text{ W} = 1 \text{ J/s}$
Flux	weber	Wb	$1 \text{ Wb} = 1 \text{ V.s}$
Flux density	tesla	T	$1 \text{ T} = 1 \text{ Wb/m}^2$
Frequency	hertz	Hz	$1 \text{ Hz} = 1 \text{ c/s (s}^{-1}\text{)}$
Electric conductance	siemens	S	$1 \text{ S} = 1 \text{ A/V}$
Electromotive force	volt	V	$1 \text{ V} = 1 \text{ W/A}$
Pressure, stress	pascal	Pa	$1 \text{ Pa} = 1 \text{ N/m}^2$